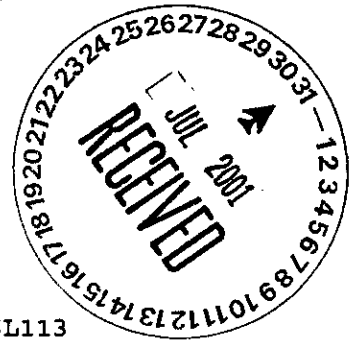
0055863

H1393



Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-059 H1393

DATE RECEIVED: 06/20/01 LVL LOT # :0106L113

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B126D6						
CHLORIDE BY IC	001	W	01LICB41	06/18/01	06/22/01	06/22/01
CHLORIDE BY IC	001 REP	W	01LICB41	06/18/01	06/22/01	06/22/01
CHLORIDE BY IC	001 MS	W	01LICB41	06/18/01	06/22/01	06/22/01
FLUORIDE BY IC	001	W	01LICB41	06/18/01	06/22/01	06/22/01
FLUORIDE BY IC	001 REP	W	01LICB41	06/18/01	06/22/01	06/22/01
FLUORIDE BY IC	001 MS	W	01LICB41	06/18/01	06/22/01	06/22/01
NITRITE BY IC	001	W	01LICB41	06/18/01	06/22/01	06/22/01
NITRITE BY IC	001 REP	W	01LICB41	06/18/01	06/22/01	06/22/01
NITRITE BY IC	001 MS	W	01LICB41	06/18/01	06/22/01	06/22/01
NITRATE BY IC	001	W	01LICB41	06/18/01	06/22/01	06/22/01
NITRATE BY IC	001 REP	W	01LICB41	06/18/01	06/22/01	06/22/01
NITRATE BY IC	001 MS	W	01LICB41	06/18/01	06/22/01	06/22/01
PHOSPHATE BY IC	001	W	01LICB41	06/18/01	06/22/01	06/22/01
PHOSPHATE BY IC	001 REP	W	01LICB41	06/18/01	06/22/01	06/22/01
PHOSPHATE BY IC	001 MS	W	01LICB41	06/18/01	06/22/01	06/22/01
SULFATE BY IC	001	W	01LICB41	06/18/01	06/22/01	06/22/01
SULFATE BY IC	001 REP	W	01LICB41	06/18/01	06/22/01	06/22/01
SULFATE BY IC	001 MS	W	01LICB41	06/18/01	06/22/01	06/22/01
NITRATE NITRITE	001	W	01LN3C36	06/18/01	07/02/01	07/02/01
NITRATE NITRITE	001 REP	W	01LN3C36	06/18/01	07/02/01	07/02/01
NITRATE NITRITE	001 MS	W	01LN3C36	06/18/01	07/02/01	07/02/01
AMMONIA	001	W	01LAMA32	06/18/01	06/27/01	06/28/01
AMMONIA	001 REP	W	01LAMA32	06/18/01	06/27/01	06/28/01
AMMONIA	001 MS	W	01LAMA32	06/18/01	06/27/01	06/28/01
TOTAL ORGANIC CARBON	001	W	01LTC037	06/18/01	07/13/01	07/13/01
TOTAL ORGANIC CARBON	001 REP	W	01LTC037	06/18/01	07/13/01	07/13/01
TOTAL ORGANIC CARBON	001 MS	W	01LTC037	06/18/01	07/13/01	07/13/01
LAB QC:						
CHLORIDE BY IC	MB1	W	01LICB41	N/A	06/22/01	06/22/01
CHLORIDE BY IC	MB1 BS	W	01LICB41	N/A	06/22/01	06/22/01
FLUORIDE BY IC	MB1	W	01LICB41	N/A	06/22/01	06/22/01
FLUORIDE BY IC	MB1 BS	W	01LICB41	N/A	06/22/01	06/22/01
NITRITE BY IC	MB1	W	01LICB41	N/A	06/22/01	06/22/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-059 H1393

DATE RECEIVED: 06/20/01 LVL LOT # :0106L113

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
NITRITE BY IC	MB1 BS	W	01LICB41	N/A	06/22/01	06/22/01
NITRATE BY IC	MB1	W	01LICB41	N/A	06/22/01	06/22/01
NITRATE BY IC	MB1 BS	W	01LICB41	N/A	06/22/01	06/22/01
PHOSPHATE BY IC	MB1	W	01LICB41	N/A	06/22/01	06/22/01
PHOSPHATE BY IC	MB1 BS	W	01LICB41	N/A	06/22/01	06/22/01
SULFATE BY IC	MB1	W	01LICB41	N/A	06/22/01	06/22/01
SULFATE BY IC	MB1 BS	W	01LICB41	N/A	06/22/01	06/22/01
NITRATE NITRITE	MB1	W	01LN3C36	N/A	07/02/01	07/02/01
NITRATE NITRITE	MB1 BS	W	01LN3C36	N/A	07/02/01	07/02/01
AMMONIA	MB1	W	01LAMA32	N/A	06/27/01	06/28/01
AMMONIA	MB1 BS	W	01LAMA32	N/A	06/27/01	06/28/01
AMMONIA	MB1 BSD	W	01LAMA32	N/A	06/27/01	06/28/01
TOTAL ORGANIC CARBON	MB1	W	01LTC037	N/A	07/13/01	07/13/01
TOTAL ORGANIC CARBON	MB1 BS	W	01LTC037	N/A	07/13/01	07/13/01

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B01-059 H1393
LVL#: 0106L113

W.O.#: 11343-606-001-9999-00
Date Received: 06-20-01

INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 water sample.

2. The sample was prepared and analyzed in accordance with the methods checked on the attached glossary.

3. Sample holding times as required by the method and/or contract were met with the exception of Nitrate, Nitrite and Phosphate that were analyzed past hold.

4. The cooler temperature was recorded on the chain of custody.

5. The method blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS for Ammonia was within the 20% Relative Percent Difference (RPD) control limit.

7. The matrix spike recoveries were within the 75-125% control limits.

8. The replicate analyses were within the 20% RPD control limit.

9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

07-26-01
Date

njp\i06-113

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 13 pages.

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR WATER SAMPLE ANALYSIS

	EPA /600	SW846	OTHER
Acidity	___ 305.1		
___Alkalinity ___Bicarbonate ___Carbonate	___ 310.1		
BOD	___ 405.1		___ 5210B (b)
Ion Chromatography:			
___Bromide ✓Chloride ✓Fluoride	✓ 300.0	___ 9056	
✓Nitrate ✓Nitrite ✓Phosphate	✓ 300.0	___ 9056	
✓Sulfate ___Formate ___Acetate ___Oxalate	✓ 300.0	___ 9056	
Chloride	___ 325.2	___ 9251	
Chorine, Residual	___ 330.5 (mod)		
Cyanide, Amenable to Chlorination	___ 335.2	___ 9010B	
Cyanide, Total	___ 335.2	___ 9010B ___ 9014	___ ILMO4.0 (e)
Cyanide, Weak Acid Dissociable		___	___ 412 (a) ___ 4500CN-I (b)
COD	___ 410.4(mod)		___ 5220C (b)
Color	___ 110.2		
Corrosivity by Coupon		___ 1110(mod)	
Chromium VI		___ 7196A	___ 3500Cr-D (b)
Fluoride	___ 340.2		___ 4500-FC
Hardness, Calcium	___ 215.2		
Hardness, Total	___ 130.2		
Iodide			___ ASTM D19P202 (1)
Surfactant	___ 425.1		
✓Nitrate-Nitrite ___Nitrate ___Nitrite	✓ 353.2		
Ammonia	✓ 350.3		
Total ___Kjeldahl ___ Organic Nitrogen	___ 351.3		
Total ✓ Organic ___ Inorganic Carbon	___ 415.1	✓ 9060	
Oil & Grease	___ 413.1	___ 9070	
___ pH ____ pH; paper	___ 150.1	___ 9040B ___ 9041A	
Petroleum Hydrocarbons, Total Recoverable	___ 418.1		
Phenol	___ 420.1 ___ 420.2	___ 9065 ___ 9066	
___Ortho ___Total Phosphate	___ 365.2		___ 4500-P B ___ C
Salinity			___ 210A (a) ___ 2520 (b)
Settleable Solids	___ 160.5		
Sulfide	___ 376.1	___ 9030B/9034 (acid soluble)	
Reactive ___Cyanide ___Sulfide		___ Section 7.3 (___9014___9030B)	
Silica	___ 370.1		
Sulfite	___ 377.1		
Sulfate	___ 375.4	___ 9038	
Specific Conductance	___ 120.1	___ 9050A	
Specific Gravity			___ D5057-90 ___ 213E (a)
Synthetic Precipitation Leach	___ 1312		
Total ___Dissolved ___Suspended ___Solids	160 ___.1 ___.2 ___.3		
Total Organic Halides	___ 450.1	___ 9020B	
Turbidity	___ 180.1		
Volatile Solids:			
___Total ___Dissolved ___Suspended	___ 160.4		
Other:		**Method:**	

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LC = Laboratory Control Sample.
NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).

b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

Lionville Lababoratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/17/01

CLIENT: TNUHANFORD B01-059 H1393 LVL LOT #: 0106L113

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B126D6	Chloride by IC	0.88	MG/L	0.25	1.0
		Fluoride by IC	0.25 u	MG/L	0.25	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.52	MG/L	0.25	1.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.28	MG/L	0.25	1.0
		Nitrate Nitrite	0.035	MG/L	0.020	1.0
		Ammonia, as N	0.12	MG/L	0.10	1.0
		Total Organic Carbon	1.1	MG/L	0.50	1.0

Lionville Lababoratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 07/17/01

CLIENT: TNUHANFORD B01-059 H1393 LVL LOT #: 0106L113

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	01LICB41-MB1	Chloride by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.25 u	MG/L	0.25	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0
BLANK10	01LN3C36-MB1	Nitrate Nitrite	0.020u	MG/L	0.020	1.0
BLANK10	01LAMA32-MB1	Ammonia, as N	0.10 u	MG/L	0.10	1.0
BLANK10	01LTC037-MB1	Total Organic Carbon	0.50 u	MG/L	0.50	1.0

Lionville Lababoratory, Inc.

INORGANICS ACCURACY REPORT 07/17/01

CLIENT: TNUHANFORD B01-059 H1393 LVL LOT #: 0106L113

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B126D6	Chloride by IC	6.5	0.88	5.0	111.7	1.0
		Fluoride by IC	10.8	0.00	10.0	108.0	1.0
		Nitrite by IC	5.12	0.25u	5.00	102.4	1.0
		Nitrate by IC	5.31	0.52	5.00	95.9	1.0
		Phosphate by IC	4.9	0.25u	5.0	97.2	1.0
		Sulfate by IC	5.2	0.28	5.0	98.6	1.0
		Nitrate Nitrite	0.50	0.035	0.50	93.6	1.0
		Ammonia, as N	2.1	0.12	2.0	99.8	1.0
		Total Organic Carbon	6.4	1.1	5.0	107.1	1.0
BLANK10	01LICB41-MB1	Chloride by IC	4.6	0.25u	5.0	91.3	1.0
		Fluoride by IC	10.7	0.25u	10.0	106.8	1.0
		Nitrite by IC	4.77	0.25u	5.00	95.3	1.0
		Nitrate by IC	4.98	0.25u	5.00	99.7	1.0
		Phosphate by IC	4.9	0.25u	5.0	99.0	1.0
		Sulfate by IC	4.8	0.25u	5.0	95.7	1.0
BLANK10	01LN3C36-MB1	Nitrate Nitrite	0.51	0.02u	0.50	102.8	1.0
BLANK10	01LAMA32-MB1	Ammonia, as N	2.0	0.10u	2.0	99.0	1.0
		Ammonia, as N MSD	2.0	0.10u	2.0	102.0	1.0
BLANK10	01LTC037-MB1	Total Organic Carbon	5.2	0.50u	5.0	104.3	1.0

Lionville Lababoratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 07/17/01

CLIENT: TNUHANFORD B01-059 H1393 LVL LOT #: 0106L113

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	01LAMA32-MB1	Ammonia, as N	99.0	102.0	3.0

Lionville Lababoratory, Inc.

INORGANICS PRECISION REPORT 07/17/01

CLIENT: TNUHANFORD B01-059 H1393 LVL LOT #: 0106L113

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B126D6	Chloride by IC	0.88	0.77	14.2	1.0
		Fluoride by IC	0.25u	0.25u	NC	1.0
		Nitrite by IC	0.25u	0.25u	NC	1.0
		Nitrate by IC	0.52	0.54	3.0	1.0
		Phosphate by IC	0.25u	0.25u	NC	1.0
		Sulfate by IC	0.28	0.26	5.6	1.0
		Nitrate Nitrite	0.035	0.035	0.00	1.0
		Ammonia, as N	0.12	0.12	4.9	1.0
		Total Organic Carbon	1.1	1.1	1.2	1.0

Lionville Laboratory Use Only
0106L113

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI — Lionville Laboratory Inc

Client: TNU-Hanford B01-059

Est. Final Proj. Sampling Date:

Project #: 11343-006-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: OJ

QC: Spec Del: Std TAT: 30 day

Date Rec'd: 6-20-01 Date Due: 7-20-01

		ABC	DE				F		G–H	H–H
Refrigerator #		1	4				4		4–H	4–H
#/Type Container	Liquid	3V	2AG				1AG		1AGH	1AGH
	Solid									
Volume	Liquid	40	1L				500		500H	500H
	Solid									
Preservatives		H2SO4	–				HNO3		–H	H2SO4H
ANALYSES REQUESTED		ORGANIC: VOA	BNA	Pest/PCB	Herb		INORG: Metal	CN		

Lionville Laboratory Use Only

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	OL24H	OL25X	MetO	HCCL HCFL HCNO2	HCNO3 HCPO4 HCSO4	INH3C IN3N2	IOCT
001	B12DD6	✓	✓	W	6-18-01	1305	✓	✓	✓	✓	✓	✓	✓

Special Instructions: SAF B01-059

DATE/REVISIONS:
MetO 1. Cd, Cr, Cu, Ni, Ag, Pb
2.
3.
4.
5.
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # See Attached
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 6° °C

Relinquished by	Received by	Date	Time
Fed Ex	V. Henry	6/20/01	0935

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES: 423579545248

Bechtel Hanford Inc. | **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** | B01-059-1 | Page 1 of 1

Collector: Thomas, G/Watson, D.	Company Contact: Todd, M. / Telephone No. (509)372-9631	Project Coordinator: TRENT, SJ	Price Code 7N / Data Turnaround 45 Days
Project Designation: 200-TW-1 & 2 - QC Sampling	Sampling Location: T-26/200 W	SAF No. B01-059	Air Quality ☐
Ice Chest No. ERC 96-065 (1 of 2)	Field Logbook No. EL-1518 / COA B20TW1A44C	Method of Shipment: Fed Ex	
Shipped To: TMA/RECRA	Offsite Property No. A010434	Bill of Lading/Air Bill No. 4235 7954 5204 ~~5208~~ RT 6/14/01	

POSSIBLE SAMPLE HAZARDS/REMARKS
Samples did not originate in radiological controlled area. No total activity associated with sample/samples. RT 6-19-01

Special Handling and/or Storage

Preservation	HNO3 to pH <2	Cool 4C	H2SO4 to pH <2 Cool 4C	HCl or H2SO4 to pH <2 Coo	Cool 4C	HNO3 to pH <2
Type of Container	P	P	P	aGs*	aG	aG
No. of Container(s)	1	1	1	3	2	2
Volume	500mL	500mL	500mL	40mL	1000mL	1000mL
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Ammonia - 350.3; NO2/NO3 - 353.1; TOC - 9060	VOA - 8260A (TCL)	Semi-VOA -- 8270A (Add-On) (Tributyl phosphate)	~~Gross Alpha; Gross Beta~~ DSW 6-19-01

Sample No.	Matrix *	Sample Date	Sample Time						
B126D6	WATER	06-18-01	1305	X	X	X	X	X	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DG WATSON / [signature]	06/18/01 1530	3728 REF. 2C	06/18/01 1530
3728 Ref 2C	6-19-01 0900	[signature] RThoren	6-19-01 0900
[signature] RThoren	6-19-01 0900	FEDEX	
Fed Ex	6/20/01 0935	[signature]	6/20/01 0935

SPECIAL INSTRUCTIONS
(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Lead}
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}

Samples stored in Ref.# 2C at the 3728 Shipping Facility on 6/18/01. Collector not available to relinquish samples on 6/19/01 for shipment.. RT 6-19-01

Matrix *: S=Soil, SE=Sediment, SO=Solid, SL=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, WI=Wipe, L=Liquid, V=Vegetation, X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Figure 1. Sample Check-in List

Date/Time Received: 6/20/01 0835

SDG#: 0106113

Work Order Number: _____ SAF# B01-059

Shipping Container ID: _____ Chain of Custody # _____

1. Custody Seals on shipping container intact? Yes [✓] No [ ]
2. Custody Seals dated and signed? Yes [✓] No [ ]
3. Chain-of-Custody record present? Yes [✓] No [ ]
4. Cooler temperature 6°
5. Vermiculite/packing materials is Wet [ ] Dry [✓]
6. Number of samples in shipping container: 14
7. Sample holding times exceeded? Yes [ ] No [✓]

8. Samples have:
   - ____ tape
   - ____ hazard labels
   - ✓ custody seals
   - ____ appropriate sample labels

9. Samples are:
   - ✓ in good condition
   - ____ leaking
   - ____ broken
   - ____ have air bubbles

10. Were any anomalies identified in sample receipt? Yes [ ] No [✓]
11. Description of anomalies (include sample numbers): _____

Sample Custodian/Laboratory: [signature] Date: 6/20/01

Telephoned to: _____ On _____ By _____

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-059 H1393

DATE RECEIVED: 06/20/01 LVL LOT # :0106L113

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B126D6						
SILVER, TOTAL	001	W	01L0411	06/18/01	07/11/01	07/16/01
SILVER, TOTAL	001 REP	W	01L0411	06/18/01	07/11/01	07/16/01
SILVER, TOTAL	001 MS	W	01L0411	06/18/01	07/11/01	07/16/01
CADMIUM, TOTAL	001	W	01L0411	06/18/01	07/11/01	07/16/01
CADMIUM, TOTAL	001 REP	W	01L0411	06/18/01	07/11/01	07/16/01
CADMIUM, TOTAL	001 MS	W	01L0411	06/18/01	07/11/01	07/16/01
CHROMIUM, TOTAL	001	W	01L0411	06/18/01	07/11/01	07/16/01
CHROMIUM, TOTAL	001 REP	W	01L0411	06/18/01	07/11/01	07/16/01
CHROMIUM, TOTAL	001 MS	W	01L0411	06/18/01	07/11/01	07/16/01
COPPER, TOTAL	001	W	01L0411	06/18/01	07/11/01	07/16/01
COPPER, TOTAL	001 REP	W	01L0411	06/18/01	07/11/01	07/16/01
COPPER, TOTAL	001 MS	W	01L0411	06/18/01	07/11/01	07/16/01
NICKEL, TOTAL	001	W	01L0411	06/18/01	07/11/01	07/16/01
NICKEL, TOTAL	001 REP	W	01L0411	06/18/01	07/11/01	07/16/01
NICKEL, TOTAL	001 MS	W	01L0411	06/18/01	07/11/01	07/16/01
LEAD, TOTAL	001	W	01L0411	06/18/01	07/11/01	07/16/01
LEAD, TOTAL	001 REP	W	01L0411	06/18/01	07/11/01	07/16/01
LEAD, TOTAL	001 MS	W	01L0411	06/18/01	07/11/01	07/16/01
LAB QC:						
SILVER LABORATORY	LC1 BS	W	01L0411	N/A	07/11/01	07/16/01
SILVER, TOTAL	MB1	W	01L0411	N/A	07/11/01	07/16/01
CADMIUM LABORATORY	LC1 BS	W	01L0411	N/A	07/11/01	07/16/01
CADMIUM, TOTAL	MB1	W	01L0411	N/A	07/11/01	07/16/01
CHROMIUM LABORATORY	LC1 BS	W	01L0411	N/A	07/11/01	07/16/01
CHROMIUM, TOTAL	MB1	W	01L0411	N/A	07/11/01	07/16/01
COPPER LABORATORY	LC1 BS	W	01L0411	N/A	07/11/01	07/16/01
COPPER, TOTAL	MB1	W	01L0411	N/A	07/11/01	07/16/01
NICKEL LABORATORY	LC1 BS	W	01L0411	N/A	07/11/01	07/16/01
NICKEL, TOTAL	MB1	W	01L0411	N/A	07/11/01	07/16/01
LEAD LABORATORY	LC1 BS	W	01L0411	N/A	07/11/01	07/16/01
LEAD, TOTAL	MB1	W	01L0411	N/A	07/11/01	07/16/01

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B01-059
LVL#: 0106L113
SDG/SAF#: H1393/B01-059

W.O.#: 1343-606-001-9999-00
Date Received: 06-20-01

METALS CASE NARRATIVE

1. This narrative covers the analyses of 1 water sample.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.

3. All analyses were performed within the required holding times.

4. The cooler temperature has been recorded on the Chain of Custody.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.

11. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

12. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

13. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

07-26-01
Date

jjw/m06-113

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 0106L113

Leaching Procedure: __1310 __1311 __1312 __Other:_____

CLP Metals __ Digestion and __ Analysis Methods: __ILM03.0 __ILM04.0

Metals Digestion Methods: X 3005A __3010A __3015 __3020A __3050B __3051 __200.7 __SS17
__Other: _____

Metals Analysis Methods

	SW846	EPA	STD MTD	EPA OSWR	USATHAMA
Aluminum	__6010B	__200.7			__99
Antimony	__6010B __7041 [5]	__200.7 __204.2			__99
Arsenic	__6010B __7060A [5]	__200.7 __206.2	__3113B		__99
Barium	__6010B	__200.7			__99
Beryllium	__6010B	__200.7			__99
Bismuth	__6010B [1]	__200.7 [1]		__1620	__99
Boron	__6010B	__200.7			__99
Cadmium	X 6010B __7131A [5]	__200.7 __213.2			__99
Calcium	__6010B	__200.7			__99
Chromium	X 6010B __7191 [5]	__200.7 __218.2			__SS17
Cobalt	__6010B	__200.7			__99
Copper	X 6010B __7211 [5]	__200.7 __220.2			__99
Iron	__6010B	__200.7			__99
Lead	X 6010B __7421 [5]	__200.7 __239.2	__3113B		__99
Lithium	__6010B __7430 [4]	__200.7		__1620	__99
Magnesium	__6010B	__200.7			__99
Manganese	__6010B	__200.7			__99
Mercury	__7470A [3] __7471A [3]	__245.1 [2] __245.5 [2]			__99
Molybdenum	__6010B	__200.7			__99
Nickel	X 6010B	__200.7			__99
Potassium	__6010B __7610 [4]	__200.7 __258.1 [4]			__99
Rare Earths	__6010B [1]	__200.7 [1]		__1620	__99
Selenium	__6010B __7740 [5]	__200.7 __270.2	__3113B		__99
Silicon	__6010B [1]	__200.7		__1620	__99
Silica	__6010B	__200.7		__1620	__99
Silver	X 6010B __7761 [5]	__200.7 __272.2			__99
Sodium	__6010B __7770 [4]	__200.7 __273.1 [4]			__99
Strontium	__6010B	__200.7			__99
Thallium	__6010B __7841 [5]	__200.7 __279.2 __200.9			__99
Tin	__6010B	__200.7			__99
Titanium	__6010B	__200.7			__99
Uranium	__6010B [1]	__200.7 [1]		__1620	__99
Vanadium	__6010B	__200.7			__99
Zinc	__6010B	__200.7			__99
Zirconium	__6010B [1]	__200.7 [1]		__1620	__99

Other:_____ Method:_____

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LCS = Laboratory Control Sample.
NC = Not calculated.

ANALYTICAL METAL METHODS

1. Not included in the method element list.

2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).

3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).

4. Flame AA.

5. Graphite Furnace AA.

Lionville Lababoratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/16/01

CLIENT: TNUHANFORD B01-059 H1393 LVL LOT #: 0106L113

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B126D6	Silver, Total	2.8	u	UG/L	2.8	1.0
		Cadmium, Total	4.3	u	UG/L	4.3	1.0
		Chromium, Total	3.9		UG/L	3.9	1.0
		Copper, Total	4.7		UG/L	2.4	1.0
		Nickel, Total	11.4	u	UG/L	11.4	1.0
		Lead, Total	31.2	u	UG/L	31.2	1.0

Lionville Lababoratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 07/16/01

CLIENT: TNUHANFORD B01-059 H1393 LVL LOT #: 0106L113

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	01L0411-MB1	Silver, Total	2.8	u	UG/L	2.8	1.0
		Cadmium, Total	4.3	u	UG/L	4.3	1.0
		Chromium, Total	3.9	u	UG/L	3.9	1.0
		Copper, Total	2.4	u	UG/L	2.4	1.0
		Nickel, Total	11.4	u	UG/L	11.4	1.0
		Lead, Total	31.2	u	UG/L	31.2	1.0

Lionville Lababoratory, Inc.

INORGANICS ACCURACY REPORT 07/16/01

CLIENT: TNUHANFORD B01-059 H1393 LVL LOT #: 0106L113

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B126D6	Silver, Total	45.3	2.8 u	50.0	90.6	1.0
		Cadmium, Total	42.6	4.3 u	50.0	85.2	1.0
		Chromium, Total	186	3.9	200	91.0	1.0
		Copper, Total	229	4.7	250	89.7	1.0
		Nickel, Total	471	11.4 u	500	94.2	1.0
		Lead, Total	463	31.2 u	500	92.5	1.0

Lionville Lababoratory, Inc.

INORGANICS PRECISION REPORT 07/16/01

CLIENT: TNUHANFORD B01-059 H1393 LVL LOT #: 0106L113

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B126D6	Silver, Total	2.8 u	2.8 u	NC	1.0
		Cadmium, Total	4.3 u	4.3 u	NC	1.0
		Chromium, Total	3.9	4.5	14.3	1.0
		Copper, Total	4.7	4.9	4.2	1.0
		Nickel, Total	11.4 u	11.4 u	NC	1.0
		Lead, Total	31.2 u	31.2 u	NC	1.0

Lionville Lababoratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 07/16/01

CLIENT: TNUHANFORD B01-059 H1393 LVL LOT #: 0106L113

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	01L0411-LC1	Silver, LCS	493	500	UG/L	98.6
		Cadmium, LCS	244	250	UG/L	97.4
		Chromium, LCS	506	500	UG/L	101.2
		Copper, LCS	1260	1250	UG/L	100.6
		Nickel, LCS	2040	2000	UG/L	102.2
		Lead, LCS	2550	2500	UG/L	102.2

Lionville Laboratory Use Only
O1O6L113

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI LIONVILLE LABORATORY INC

Client: TNU-Hanford B01-059
Est. Final Proj. Sampling Date:
Project #: 11343-606-001-9999-00
Project Contact/Phone #:
Lionville Laboratory Project Manager: OJ
QC: Spc Del: Std TAT: 30 day

Date Rec'd: 6-20-01 Date Due: 7-20-01

	ABC	DE							F		G	H		
Refrigerator #	1	4							4		4	4		
#/Type Container Liquid	3v	2AG							1AG		1AG	1AG		
#/Type Container Solid														
Volume Liquid	40	1L							500		500	500		
Volume Solid														
Preservatives	H2SO4	-							HNO3		-	H2SO4		
ANALYSES REQUESTED	ORGANIC: VOA	BNA	Pest/PCB	Herb					INORG: Metal	CN				

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	O624H	O625X							Mt Ⓞ		ICCL ICFL ICNO2	ICNO3 ICPO4 ICSO4	INH3N	ICN3U	IOCT	
001	B12QD6	✓	✓	W	6/18/01	1305	✓	✓							✓		✓	✓	✓	✓		

Special Instructions: SAF B01-059

DATE/REVISIONS:
MtⓄ 1. Cd, Cr, Cu, Ni, Ag, Pb
2.
3.
4.
5.
6.

Lionville Laboratory Use Only
Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # See Below
2) Ambient or Chilled (circled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 6 °C

Relinquished by	Received by	Date	Time
Fed Ex	V. Herring	6/20/01	0935

Relinquished by	Received by	Date	Time

COMPOSITE WASTE

ORIGINAL REWRITTEN

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES: 423579545248

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-059-1	Page 1 of 1
Collector Thomas, G/Watson, D.	Company Contact Todd, M.	Telephone No. (509)372-9631	Project Coordinator TRENT, SJ	Price Code 7N Air Quality ☐	Data Turnaround 45 Days
Project Designation 200-TW-1 & 2 - QC Sampling	Sampling Location T-26/200 W		SAF No. B01-059		
Ice Chest No. ERC 96-065 (1 of 2)	Field Logbook No. EL-1518	COA B20TW1A44C	Method of Shipment Fed Ex		
Shipped To TMA/RECRA	Offsite Property No. A010434		Bill of Lading/Air Bill No. 423579541	2204 5200	RT 6/14/01

POSSIBLE SAMPLE HAZARDS/REMARKS
Samples did not originate in radiological controlled area. No total activity associated with sample/samples.

Special Handling and/or Storage RT 6-19-01

Preservation	HNO3 to pH <2	Cool 4C	H2SO4 to pH <2 Cool 4C	HCl or H2SO4 to pH <2 Coo	Cool 4C	HNO3 to pH <2				
Type of Container	P	P	P	aGs*	aG	aG				
No. of Container(s)	1	1	1	3	2	2				
Volume	500mL	500mL	500mL	40mL	1000mL	1000mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Ammonia - 350.3; NO2/NO3 - 353.1; TOC - 9060	VOA - 8260A (TCL)	Semi-VOA – 8270A (Add-On) (Tributyl phosphate)	Gross Alpha; Gross Beta				
Sample No.	Matrix *	Sample Date	Sample Time							
B126D6	WATER	06-18-01	1305	X	X	X	X	X		

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
TO WATSON/[illegible]	06/18/01 1530	REF. 2C 3728	06/18/01 1530
Ref 2C 3728	6-19-01 0900	R Thoren	6-19-01 0900
R Thoren	6-19-01 0900	FED EX	
FED EX	6/20/01 0935	[illegible]	6/20/01 0935
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Lead}
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}

Samples stored in Ref. 2C at the 3728 Shipping Facility on 6/18/01.
Collector not available to relinquish samples on 6/19/01 for shipment.. RT 6/9/01

Matrix *
S=Soil
SD=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (10/99)

Lionville Laboratory, Inc.
BNA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-059 H1393

DATE RECEIVED: 06/20/01 LVL LOT # :0106L113

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B126D6	001	W	01LE0737	06/18/01	06/21/01	07/05/01
B126D6	001 MS	W	01LE0737	06/18/01	06/21/01	07/05/01
B126D6	001 MSD	W	01LE0737	06/18/01	06/21/01	07/05/01
LAB QC:						
SBLKAQ	MB1	W	01LE0737	N/A	06/21/01	07/05/01
SBLKAQ	MB1 BS	W	01LE0737	N/A	06/21/01	07/05/01

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B01-059
RFW #: 0106L113
SDG/SAF #: H1393/B01-059

W.O. #: 11343-606-001-9999-00
Date Received: 06-20-2001

SEMIVOLATILE

One (1) water sample was collected on 06-18-2001.

The sample and its associated QC samples were extracted on 06-21-2001 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for client specified Tributylphosphate Semivolatile target compound on 07-05-2001.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.

2. The sample was extracted and analyzed within required holding times.

3. Three (3) of fifteen (15) surrogate recoveries were outside EPA QC limits. However, EPA CLP surrogate recovery criteria were met (i.e., no more than one outlier per fraction {acid and base neutral} and no recoveries less than 10%).

4. All matrix spike recoveries were within EPA QC limits.

   Three (3) of eleven (11) blank spike recoveries were outside EPA QC limits.

   The target compound is not included in the spiking solution. (CLP spike recoveries have been reported on the Form 3.) A copy of the Sample Discrepancy Report (SDR) has been enclosed.

5. Internal standard area and retention time criteria were met.

6. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

J. Michael Taylor
President
Lionville Laboratory Incorporated

7/20/01
Date

som\gorup\data\bna\tnu-hanford-0106-113.doc

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 01MS246

Initiator: John W. Smith Batch: 01061113 Parameter: 0625X
Date: 7/9/01 Samples: 35 Matrix: Water
Client: TW Haulard BG-059 H1393 Method: SW846/MCAWW/CLP/ Prep Batch: 01L20737

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code __ Other _____

b. General Discrepancy

__ Missing Sample/Extract* __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. Problem (Include all relevant specific results; attach data if necessary)

Three spikes fail low in BS. MS/MSD meet criteria

2. Known or Probable Causes(s)

3. Discussion and Proposed Action

Other Description: Report + Narrak

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

4. Project Manager Instructions...signature/date: [signature] 7/9/01

✓ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: [signature] 7/9/01 Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
X Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Beegle
__	X Lab General Manager: M. Taylor	__	__ Inorganic: Perrone
__	X Project Mgr: Stone/Johnson/Haslett	__	__ GC/LC: Kiger
__	X Technical Mgr: Wesson/Daniels	__	__ MS: Rychlak/Layman
__	X QA (file): Alberts	__	__ Log-in: Keppel
__	__ Data Management: Feldman	__	__ Admin: Soos
__	__ Sample Prep: Beegle/Kiger	__	__ Other: _____

GLOSSARY OF BNA DATA

DATA QUALIFIERS

U	=	Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
J	=	Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
D	=	Identifies all compounds identified in an analysis at a secondary dilution factor.
I	=	Interference.
NQ	=	Result qualitatively confirmed but not able to quantify.
A	=	Indicates that a TIC is a suspected aldol-condensation product.
N	=	Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
X	=	This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
Y	=	Additional qualifiers used as required are explained in the case narrative.

GLOSSARY OF BNA DATA

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.

TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quantitation modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quantitation *modifications*:

MP - Missed Peak: manually added peak not found by automatic quantitation program.

PA - Peak Assignment: quantitation report was changed to reflect correct peak assignment.

RI - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.

SP - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.

CB - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.

PI - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, Special List — Report Date: 07/17/01 16:18

RFW Batch Number: **0106L113** Client: **TNUHANFORD B01-059 H1393** Work Order: 11343606001 Page: 1a

	Cust ID:	B126D6	B126D6	B126D6	SBLKAQ	SBLKAQ BS
Sample Information	RFW#:	001	001 MS	001 MSD	01LE0737-MB1	01LE0737-MB1
	Matrix:	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	UG/L	UG/L	UG/L	UG/L	UG/L
Surrogate Recovery	Nitrobenzene-d5	52 %	72 %	62 %	60 %	52 %
	2-Fluorobiphenyl	40 * %	59 %	51 %	41 * %	36 * %
	Terphenyl-d14	64 %	86 %	72 %	68 %	57 %
Tributylphosphate		12 U	22 U	22 U	10 U	10 U

*= Outside of EPA CLP QC limits.

3C

WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Lionville Labs, Inc. Contract: 1343-06-01

Case No.: TNUHANFORD B01-059 H1393 RFW Lot No.: 0106L113-001

MATRIX Spike - Sample No.: B126D6 Level:(low/med) LOW

COMPOUND	SPIKE ADDED UG/L	SAMPLE CONCENTRATION UG/L	MS CONCENTRATION UG/L	MS % REC #	QC LIMITS REC
Phenol	166	0.643	107	64	12 -110
2-Chlorophenol	166	0	101	60	27 -123
1,4-Dichlorobenzene	111	0	58.4	53	36 - 97
N-Nitroso-Di-n-propylamine	111	0	84.8	76	41 -116
1,2,4-Trichlorobenzene	111	0	58.8	53	39 - 98
4-Chloro-3-methylphenol	166	0	121	73	23 - 97
Acenaphthene	111	0	74.1	67	46 -118
4-Nitrophenol	166	0	129	78	10 - 80
2,4-Dinitrotoluene	111	0	86.7	78	24 - 96
Pentachlorophenol	166	0	81.3	49	9 -103
Pyrene	111	0	94.1	85	26 -127

COMPOUND	SPIKE ADDED UG/L	MSD CONCENTRATION UG/L	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC
Phenol	166	94.8	57	11	42	12 -110
2-Chlorophenol	166	88.8	53	12	40	27 -123
1,4-Dichlorobenzene	111	49.6	45	16	28	36 - 97
N-Nitroso-Di-n-propylamine	111	74.7	67	12	38	41 -116
1,2,4-Trichlorobenzene	111	51.9	47	12	28	39 - 98
4-Chloro-3-methylphenol	166	107	64	13	42	23 - 97
Acenaphthene	111	63.5	57	16	31	46 -118
4-Nitrophenol	166	109	65	18	50	10 - 80
2,4-Dinitrotoluene	111	76.7	69	12	38	24 - 96
Pentachlorophenol	166	64.8	39	22	50	9 -103
Pyrene	111	83.9	76	11	31	26 -127

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 11 outside limits
Spike Recovery: 0 out of 22 outside limits

COMMENTS:

3C

WATER SEMIVOLATILE BLANK SPIKE RECOVERY

Lab Name: Lionville Labs, Inc. Contract: 1343-06-01

Case No.: TNUHANFORD B01-059 H1393 RFW Lot No.: 0106L113

BLANK Spike - Sample No.: SBLKAQLE0737-MB1 Level:(low/med) LOW

COMPOUND	SPIKE ADDED UG/L	SAMPLE CONCENTRATION UG/L	BS CONCENTRATION UG/L	BS % REC	#	QC LIMITS REC
Phenol	75.0	0	36.2	48		12 -110
2-Chlorophenol	75.0	0	33.3	44		27 -123
1,4-Dichlorobenzene	50.0	0	11.8	24	*	36 - 97
N-Nitroso-Di-n-propylamine	50.0	0	27.0	54		41 -116
1,2,4-Trichlorobenzene	50.0	0	12.9	26	*	39 - 98
4-Chloro-3-methylphenol	75.0	0	37.0	49		23 - 97
Acenaphthene	50.0	0	21.1	42	*	46 -118
4-Nitrophenol	75.0	0	33.5	45		10 - 80
2,4-Dinitrotoluene	50.0	0	23.9	48		24 - 96
Pentachlorophenol	75.0	0	16.7	22		9 -103
Pyrene	50.0	0	28.0	56		26 -127

Column to be used to flag recovery value with an asterisk
* Values outside of QC limits

Spike Recovery: 3 out of 11 outside limits

COMMENTS:

Lionville Laboratory Use Only
0106L113

Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI Lionville Laboratory Inc

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: THU-Hanford B01-059
Est. Final Proj. Sampling Date:
Project #: 11343-006-001-9999-00
Project Contact/Phone #:
Lionville Laboratory Project Manager: OJ
QC: Spec Del: Std TAT: 30 day
Date Rec'd: 6-20-01 Date Due: 7-20-01

	ABC	DE					F		G	H		
Refrigerator #	1	4					4		4	4		
#/Type Container Liquid	3V	2AG					1AG		1AG	1AG		
#/Type Container Solid												
Volume Liquid	40	1L					500		500	500		
Volume Solid												
Preservatives	H2SO4	-					HNO3		-	H2SO4		
ANALYSES REQUESTED	ORGANIC: VOA	BNA	Pest/PCB	Herb			INORG: Metal	CN				

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	8260H	8270X					Met ①		HCCL HCFL HCNO3	HCNO2 HCPO4 HCSO4	HIN3C	HUN3C	IOCT
001	B1260D6	✓	✓	W	6-18-01	1305	✓	✓					✓		✓	✓	✓		✓

Special Instructions: SAF B01-059

DATE/REVISIONS:
Met ① 1. Cd, Cr, Cu, Ni, Ag, Pb
2.
3.
4.
5.
6.

Lionville Laboratory Use Only
Samples were: 1) Shipped ___ or Hand Delivered ___ Airbill # See Below
2) Ambient or Chilled (circled)
3) Received in Good Condition Y or N (Y)
4) Samples Properly Preserved Y or N (Y)
5) Received Within Holding Times Y or N (Y)

Tamper Resistant Seal was:
1) Present on Outer Package Y or N (Y)
2) Unbroken on Outer Package Y or N (Y)
3) Present on Sample Y or N (Y)
4) Unbroken on Sample Y or N (Y)
COC Record Present Upon Sample Rec't Y or N (Y)
Cooler Temp. 6 °C

Relinquished by	Received by	Date	Time
Fed Ex	V. Henry	6/20/01	0935

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or N (N)
NOTES: #823579545248

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-059-1	Page 1 of 1
Collector: Thomas, G/Watson, D.	Company Contact: Todd, M. — Telephone No.: (509)372-9631	Project Coordinator: TRENT, SJ	Price Code: 7N — Data Turnaround: 45 Days
Project Designation: 200-TW-1 & 2 - QC Sampling	Sampling Location: T-26/200 W	SAF No.: B01-059	Air Quality ☐
Ice Chest No.: ERC 96-065 (1 of 2)	Field Logbook No.: EL-1518 — COA: B20TW1A44C	Method of Shipment: Fed Ex	
Shipped To: ~~TMA~~/RECRA	Offsite Property No.: A0104134	Bill of Lading/Air Bill No.: 423579541 3204 ~~3200~~ RT 6/19/01	

POSSIBLE SAMPLE HAZARDS/REMARKS
Samples did not originate in radiological controlled area. No total activity associated with sample/samples. RT 6-19-01

Special Handling and/or Storage

Preservation	HNO3 to pH <2	Cool 4C	H2SO4 to pH <2 Cool 4C	HCl or H2SO4 to pH <2 Coo	Cool 4C	HNO3 to pH <2				
Type of Container	P	P	P	aGs*	aG	aG				
No. of Container(s)	1	1	1	3	2	2				
Volume	500mL	500mL	500mL	40mL	1000mL	1000mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Ammonia - 350.3; NO2/NO3 - 353.1; TOC - 9060	VOA - 8260A (TCL)	Semi-VOA - 8270A (Add-On) (Tributyl phosphate)	Gross Alpha; Gross Beta				
Sample No.	Matrix *	Sample Date	Sample Time							
B126D6	WATER	06-18-01	1305	X	X	X	X	X		

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
TG WATSON/CR BOYLE	06/18/01 1530	REF. 2C	06/18/01 1530
Ref 2C	6-19-01 0900	R Thoren	6-19-01 0900
R Thoren	6-19-01 0900	FED EX	
FED EX	6/20/01 0935		6/20/01 0935

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Lead}
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}

Samples stored in Ref. 2C at the 3728 Shipping Facility on 6/18/01.
Collector not available to relinquish samples on 6/19/01 for shipment.. RT 6/19/01

Matrix *
S=Soil
SD=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (10/99)

Lionville Laboratory, Inc.
VOA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-059 H1393

RFW LOT # :0106L113

CLIENT ID	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
B126D6	001	W	01LVX189	06/18/01	06/20/01	N/A	06/29/01
B126D6	001 MS	W	01LVX189	06/18/01	06/20/01	N/A	06/29/01
B126D6	001 MSD	W	01LVX189	06/18/01	06/20/01	N/A	06/29/01
LAB QC:							
VBLKFX	MB1	W	01LVX189	N/A	N/A	N/A	06/29/01
VBLKFX	MB1 BS	W	01LVX189	N/A	N/A	N/A	06/29/01

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B01-059
RFW #: 0106L113
SDG/SAF #: H1393/B01-059

W.O. #: 11343-606-001-9999-00
Date Received: 06-20-2001

GC/MS VOLATILE

One (1) water sample was collected on 06-18-2001.

The sample and its associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8260A for TCL Volatile target compounds on 06-29-2001.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.

2. The sample was analyzed within required holding time.

3. Non-target compounds were not detected in the sample.

4. All surrogate recoveries were within EPA QC limits.

5. All matrix spike recoveries were within EPA QC limits.

6. All blank spike recoveries were within EPA QC limits.

7. The method blank contained the common laboratory contaminants Methylene Chloride and Acetone at levels less than 2x the CRQL.

8. Internal standard area and retention time criteria were met.

9. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

J. Michael Taylor
President
Lionville Laboratory Incorporated

7/27/01
Date

som\group\data\voa\tnu-hanford\0106-113.doc

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

GLOSSARY OF VOA DATA

DATA QUALIFIERS

U = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.

J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

D = Identifies all compounds identified in an analysis at a secondary dilution factor.

I = Interference.

NQ = Result qualitatively confirmed but not able to quantify.

N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.

X = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).

Y = Additional qualifiers used as required are explained in the case narrative.

VLI
VOLATILE LABORATORY INC

GLOSSARY OF VOA DATA

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.

VLI
VONMILE LABORATORY INC

TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quantitation modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quantitation modifications:

MP - Missed Peak: manually added peak not found by automatic quantitation program.

PA - Peak Assignment: quantitation report was changed to reflect correct peak assignment.

RI - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.

SP - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.

CB - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.

PI - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

Lionville Laboratory, Inc.
Volatiles by GC/MS, HSL List Report Date: 07/18/01 15:12

RFW Batch Number: **0106L113** Client: **TNUHANFORD B01-059 H1393** Work Order: 11343606001 Page: 1a

	Cust ID:	B126D6	B126D6	B126D6	VBLKFX	VBLKFX BS
Sample Information	RFW#:	001	001 MS	001 MSD	01LVX189-MB1	01LVX189-MB1
	Matrix:	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	ug/L	ug/L	ug/L	ug/L	ug/L
Surrogate Recovery	Toluene-d8	101 %	97 %	98 %	101 %	101 %
	Bromofluorobenzene	103 %	100 %	100 %	103 %	105 %
	1,2-Dichloroethane-d4	89 %	87 %	86 %	94 %	95 %
Chloromethane		10 U	10 U	10 U	10 U	10 U
Bromomethane		10 U	10 U	10 U	10 U	10 U
Vinyl Chloride		10 U	10 U	10 U	10 U	10 U
Chloroethane		10 U	10 U	10 U	10 U	10 U
Methylene Chloride		6 B	2 JB	7 B	10	7 B
Acetone		10 U	10 U	10 U	6 J	10 U
Carbon Disulfide		5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene		5 U	107 %	115 %	5 U	107 %
1,1-Dichloroethane		5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethene (total)		5 U	5 U	5 U	5 U	5 U
Chloroform		5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane		5 U	5 U	5 U	5 U	5 U
2-Butanone		10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane		5 U	5 U	5 U	5 U	5 U
Carbon Tetrachloride		5 U	5 U	5 U	5 U	5 U
Bromodichloromethane		5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane		5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene		5 U	5 U	5 U	5 U	5 U
Trichloroethene		5 U	102 %	100 %	5 U	104 %
Dibromochloromethane		5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane		5 U	5 U	5 U	5 U	5 U
Benzene		5 U	106 %	105 %	5 U	114 %
Trans-1,3-Dichloropropene		5 U	5 U	5 U	5 U	5 U
Bromoform		5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone		10 U	10 U	10 U	10 U	10 U
2-Hexanone		10 U	10 U	10 U	10 U	10 U
Tetrachloroethene		5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane		5 U	5 U	5 U	5 U	5 U
Toluene		5 U	102 %	102 %	5 U	103 %

*= Outside of EPA CLP QC limits.

RFW Batch Number: **0106L113** Client: **TNUHANFORD B01-059 H1393** Work Order: 11343606001 Page: 1b

	Cust ID:	**B126D6**	**B126D6**	**B126D6**	**VBLKFX**	**VBLKFX BS**
	RFW#:	**001**	**001 MS**	**001 MSD**	**01LVX189-MB1**	**01LVX189-MB1**
Chlorobenzene		5 U	100 %	96 %	5 U	102 %
Ethylbenzene		5 U	5 U	5 U	5 U	5 U
Styrene		5 U	5 U	5 U	5 U	5 U
Xylene (total)		5 U	5 U	5 U	5 U	5 U

*= Outside of EPA CLP QC limits.

Lionville Laboratory Use Only

0106L113

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI

Client: TNU-Hanford B01-059

Est. Final Proj. Sampling Date:

Project #: 11343-006-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: OJ

QC: Spec Del: Std TAT: 30 day

Date Rec'd: 6-20-01 Date Due: 7-20-01

	A B C	D E			F		G	H	
Refrigerator #	1	4			4		4	4	
#/Type Container – Liquid	3V	2AG			1AG		1AG	1AG	
#/Type Container – Solid									
Volume – Liquid	40	1L			500		500	500	
Volume – Solid									
Preservatives	H_2SO_4	–			HNO_3		–	H_2SO_4	
ANALYSES REQUESTED	ORGANIC: VOA	BNA	Pest/PCB	Herb	INORG: Metal	CN			
Lionville Laboratory Use Only	0624H	0625X			Mt0		ICCL ICFL ICNO2 ICNO3 ICPO4 ICSO4	INH3N INO3N	IOCT

MATRIX CODES: S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	0624H	0625X	Mt0	ICCL ICFL ICNO2	ICNO3 ICPO4 ICSO4	INH3N INO3N	IOCT
001	B1210D6	✓	✓	W	6-18-01	1305	✓	✓	✓	✓	✓	✓	✓

Special Instructions: Saf B01-059

DATE/REVISIONS:
Mt0 1. Cd, Cr, Cu, Ni, Ag, Pb
2.
3.
4.
5.
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # See Below
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 6° °C

Relinquished by	Received by	Date	Time
Fred Ef	V. Hurd	6/20/01	0935

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES: 423579545248

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-059-1	Page 1 of 1
Collector Thomas, G/Watson, D.	Company Contact Todd, M.	Telephone No. (509)372-9631	Project Coordinator TRENT, SJ	Price Code 7N Air Quality ☐	Data Turnaround 45 Days
Project Designation 200-TW-1 & 2 - QC Sampling	Sampling Location T-26/200 W		SAF No. B01-059		
Ice Chest No. ERC 96-065 (1 of 2)	Field Logbook No. EL-1518	COA B20TW1A44C	Method of Shipment Fed Ex		
Shipped To TMA/RECRA	Offsite Property No. A010434		Bill of Lading/Air Bill No. 423579541 5204 RT 6/14/01		

POSSIBLE SAMPLE HAZARDS/REMARKS
Samples did not originate in radiological controlled area. No total activity associated with sample/samples.
RT 6-19-01

Special Handling and/or Storage

Preservation	HNO3 to pH <2	Cool 4C	H2SO4 to pH <2 Cool 4C	HCl or H2SO4 to pH <2 Coo	Cool 4C	HNO3 to pH <2				
Type of Container	P	P	P	aGs*	aG	aG				
No. of Container(s)	1	1	1	3	2	2				
Volume	500mL	500mL	500mL	40mL	1000mL	1000mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Ammonia - 350.3; NO2/NO3 - 353.1; TOC - 9060	VOA - 8260A (TCL)	Semi-VOA – 8270A (Add-On) (Tributyl phosphate)	Gross Alpha; Gross Beta				
Sample No.	Matrix *	Sample Date	Sample Time							
B126D6	WATER	06-18-01	1305	X	X	X	X	X		

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
D WATSON/[illegible]	06/18/01 1530	REF. 2C 3728	06/18/01 1530
Ref 2C 3728	6-19-01 0900	R Thoren	6-19-01 0900
R Thoren	6-19-01 0900	FED EX	
FED EX	6/20/01 0935	[illegible]	6/20/01 0935

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Lead}
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}

Samples stored in Ref. 2C at the 3728 Shipping Facility on 6/18/01.
Collector not available to relinquish samples on 6/18/01 for shipment..
RT 6/19/01

Matrix *
S=Soil
SD=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time	

BHI-EE-011 (10/99)

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1393 was composed of one water sample designated under SAF No. B01-059 with a Project Designation of: 200-TW-1 & 2 – QC Sampling.

The sample was received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Melissa Mannion — 8/3/01

Melissa C. Mannion
Program Manager

Date

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1393

SDG 7018
Contact Melissa C. Mannion

SAMPLE SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1393

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B126D6	T-26/200 W	WATER		R106111-01	B01-059	B01-059-01	06/18/01 13:05
Method Blank		WATER		R106111-03	B01-059		
Lab Control Sample		WATER		R106111-02	B01-059		
Duplicate (R106111-01)	T-26/200 W	WATER		R106111-04	B01-059		06/18/01 13:05

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 08/03/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1393

QC SUMMARY

SDG 7018
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H1393

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7018	B01-059-01	B126D6	WATER		2.0 L		06/20/01	2	R106111-01	7018-001
		Method Blank	WATER						R106111-03	7018-003
		Lab Control Sample	WATER						R106111-02	7018-002
		Duplicate (R106111-01)	WATER		2.0 L		06/20/01	2	R106111-04	7018-004

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 08/03/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1393

SDG 7018
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1393

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Gas Proportional Counting												
93A	WATER	Gross Alpha in Water	6994-043	20.0	1			1	1	1/1		
93B	WATER	Gross Beta in Water	6994-043	15.0	1			1	1	1/1		

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 08/03/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1393

WORK SUMMARY

SDG 7018
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H1393

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B126D6			R106111-01	7018-001	93A/93		07/27/01	08/03/01	MCM	Gross Alpha in Water
T-26/200 W		WATER	06/18/01	7018-001	93B/93		07/27/01	08/03/01	MCM	Gross Beta in Water
B01-059-01	B01-059		06/20/01							
Method Blank			R106111-03	7018-003	93A/93		07/27/01	08/03/01	MCM	Gross Alpha in Water
		WATER		7018-003	93B/93		07/27/01	08/03/01	MCM	Gross Beta in Water
	B01-059									
Lab Control Sample			R106111-02	7018-002	93A/93		07/27/01	08/03/01	MCM	Gross Alpha in Water
		WATER		7018-002	93B/93		07/27/01	08/03/01	MCM	Gross Beta in Water
	B01-059									
Duplicate (R106111-01)			R106111-04	7018-004	93A/93		08/02/01	08/03/01	MCM	Gross Alpha in Water
T-26/200 W		WATER	06/18/01	7018-004	93B/93		08/02/01	08/03/01	MCM	Gross Beta in Water
	B01-059		06/20/01							

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
93A/93	B01-059	Gross Alpha in Water	900.0_ALPHABETA_GPC	1			1	1	1		4
93B/93	B01-059	Gross Beta in Water	900.0_ALPHABETA_GPC	1			1	1	1		4
TOTALS				2			2	2	2		8

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 08/03/01

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1393

R106111-03 **Method Blank**

METHOD BLANK

SDG 7018	Client/Case no Hanford	SDG H1393	
Contact Melissa C. Mannion	Contract No. 630		
Lab sample id R106111-03	Client sample id Method Blank		
Dept sample id 7018-003	Material/Matrix	WATER	
	SAF No B01-059		

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-0.365	0.45	1.1	3.0	U	93A
Gross Beta	12587-47-2	0.405	2.2	3.6	4.0	U	93B

QC-BLANK #39080

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/03/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1393

R106111-02 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7018 Client/Case no Hanford SDG H1393
Contact Melissa C. Mannion Case no No. 630

Lab sample id R106111-02 Client sample id Lab Control Sample
Dept sample id 7018-002 Material/Matrix WATER
SAF No B01-059

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	58.8	4.8	1.3	3.0		93A	71.7	2.9	82	73-127	70-130
Gross Beta	76.4	3.8	2.8	4.0		93B	80.7	3.2	95	77-123	70-130

QC-LCS #39079

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 08/03/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1393

R106111-04 B126D6

DUPLICATE

SDG 7018 Client/Case no Hanford SDG H1393

Contact Melissa C. Mannion Case no No. 630

DUPLICATE		ORIGINAL			
Lab sample id	R106111-04	Lab sample id	R106111-01	Client sample id	B126D6
Dept sample id	7018-004	Dept sample id	7018-001	Location/Matrix	T-26/200 W WATER
		Received	06/20/01	Collected/Volume	06/18/01 13:05 2.0 L
				Custody/SAF No	B01-059-01 B01-059

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Gross Alpha	0.055	0.41	0.72	3.0	U	93A	-0.018	0.47	0.87	U	-	
Gross Beta	3.50	1.3	1.9	4.0	J	93B	3.58	1.3	1.9	J	2	84

QC-DUP#1 39081

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 08/03/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1393

R106111-01 **B126D6**

DATA SHEET

SDG	7018	Client/Case no	Hanford SDG H1393
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R106111-01	Client sample id	B126D6
Dept sample id	7018-001	Location/Matrix	T-26/200 W WATER
Received	06/20/01	Collected/Volume	06/18/01 13:05 2.0 L
		Custody/SAF No	B01-059-01 B01-059

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-0.018	0.47	0.87	3.0	U	93A
Gross Beta	12587-47-2	3.58	1.3	1.9	4.0	J	93B

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/03/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1393

Test 93A Matrix WATER
SDG 7018
Contact Melissa C. Mannion

METHOD SUMMARY

GROSS ALPHA IN WATER
GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. 630
Contract SDG H1393

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Alpha	
Preparation batch 6994-043						
B126D6	R106111-01	93		7018-001	U	
BLK (QC ID=39080)	R106111-03	93		7018-003	U	
LCS (QC ID=39079)	R106111-02	93		7018-002	ok	
Duplicate (R106111-01)	R106111-04	93		7018-004	-	U
Nominal values and limits from method				RDLs (pCi/L)	3.0	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6994-043	2σ prep error 20.0 %			Reference Lab Notebook 6994 pg. 043												
B126D6	R106111-01	93		0.87	0.300			1	100				39	07/25/01	07/27	GRB-109
BLK (QC ID=39080)	R106111-03	93		1.1	0.300			22	100					07/25/01	07/27	GRB-106
LCS (QC ID=39079)	R106111-02	93		1.3	0.300			21	100					07/25/01	07/27	GRB-105
Duplicate (R106111-01) (QC ID=39081)	R106111-04	93		0.72	0.300			1	100				45	07/25/01	08/02	GRB-101
Nominal values and limits from method				3.0	0.300			5-250	100				180			

PROCEDURES	REFERENCE	900.0_ALPHABETA_GPC
	CP-060	Soil Preparation, rev 3
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
	CP-170	Soil Preparation for Direct Gross Alpha and Gross Beta Counting, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 1.0 ± 0.51
RESIDUE 11 ± 24

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/03/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1393

Test 93B Matrix WATER
SDG 7018
Contact Melissa C. Mannion

METHOD SUMMARY

GROSS BETA IN WATER
GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. 630
Contract SDG H1393

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Beta	
Preparation batch 6994-043						
B126D6	R106111-01	93		7018-001	3.58	J
BLK (QC ID=39080)	R106111-03	93		7018-003	U	
LCS (QC ID=39079)	R106111-02	93		7018-002	ok	
Duplicate (R106111-01)	R106111-04	93		7018-004	ok	J
Nominal values and limits from method				RDLs (pCi/L)	4.0	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6994-043	2σ prep error 15.0 %			Reference Lab Notebook 6994 pg. 043												
B126D6	R106111-01	93		1.9	0.300			1		100			39	07/25/01	07/27	GRB-109
BLK (QC ID=39080)	R106111-03	93		3.6	0.300			22		100				07/25/01	07/27	GRB-106
LCS (QC ID=39079)	R106111-02	93		2.8	0.300			21		100				07/25/01	07/27	GRB-105
Duplicate (R106111-01) (QC ID=39081)	R106111-04	93		1.9	0.300			1		100			45	07/25/01	08/02	GRB-101
Nominal values and limits from method				4.0	0.300			5-250		100			180			

PROCEDURES	REFERENCE	
	900.0_ALPHABETA_GPC	
	CP-060	Soil Preparation, rev 3
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
	CP-170	Soil Preparation for Direct Gross Alpha and Gross Beta Counting, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES			
	MDA	2.6	± 1.6
	RESIDUE	11	± 24

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/03/01

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-059-1	Page 1 of 1
Collector Thomas, G/Watson, D.	**Company Contact** Todd, M. **Telephone No.** (509)372-9631	**Project Coordinator** TRENT, SJ	**Price Code** 7N **Data Turnaround** 45 Days
Project Designation 200-TW-1 & 2 - QC Sampling	**Sampling Location** T-26/200 W H1393 (7018)	**SAF No.** B01-059	**Air Quality** ☐
Ice Chest No. ER SM1-137 (2 of 2)	**Field Logbook No.** EL-1518 **COA** B20TW1A44C	**Method of Shipment** Fed Ex	
Shipped To ~~CMARBERA~~ EBERLINE	**Offsite Property No.** A 010423	**Bill of Lading/Air Bill No.** 42357454 5237	

POSSIBLE SAMPLE HAZARDS/REMARKS
Samples did not originate in radiological controlled area. No total activity associated with sample/samples. RT 6-19-01
Special Handling and/or Storage

Preservation	HNO3 to pH <2	Cool 4C	H2SO4 to pH <2 Cool 4C	HCl or H2SO4 to pH <2 Coo	Cool 4C	HNO3 to pH <2				
Type of Container	P	P	P	aGs*	aG	aG				
No. of Container(s)	1	1	1	3	2	2				
Volume	500mL	500mL	500mL	40mL	1000mL	1000mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Ammonia - 350.3; NO2/NO3 - 353.1; TOC - 9060	VOA - 8260A (TCL)	Semi-VOA – 8270A (Add-On) (Tributyl phosphate)	Gross Alpha; Gross Beta				

Sample No.	Matrix *	Sample Date	Sample Time									
B126D6 (1+)	WATER	06-18-01	1305						X			

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DG WATSON	06/18/01 1530	REF. 2C 3726	06/18/01 1530
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
K.R. 2C 3728	6-19-01 0900	R Thorne	6-19-01 0900
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R Thorne	6-19-01 0900	FEDEX	6-19-01
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
FED. EXPRESS	C-20-01 10 AM	SCA-2 C. Degner	6-20-01 10 AM
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS
~~(1) ICP Metals - 6010A (TAL) (Cadmium, Chromium, Copper, Nickel, Silver); ICP Metals - 6010A (Total as) (Lead)~~
~~(2) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)~~
RT 6-19-01

Samples stored in Ref.# 2C at the 3728 Shipping Facility on 6/18/01.
Collector not available to relinquish samples on 6/19/01 for shipment.
RT 6-19-01

Matrix *
S=Soil
SD=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WP=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (10/99)

ThermoRetec
Richmond Laboratory

Analytical Services

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: BECHTEL HANFORD INC. Date/Time received 6-20-01 10:Am

CoC No. B01-059-1

Container I.D. No. SML-137 Requested TAT (Days) 20 P.O. Received Yes [ ] No [✓]

INSPECTION

1.	Custody seals on shipping container intact?	Yes [✓]	No [ ]	N/A [ ]
2.	Custody seals on shipping container dated & signed?	Yes [✓]	No [ ]	N/A [ ]
3.	Custody seals on sample containers intact?	Yes [✓]	No [ ]	N/A [ ]
4.	Custody seals on sample containers dated & signed?	Yes [✓]	No [ ]	N/A [ ]
5.	Cooler Temperature: _____	Packing material is:	Wet [ ]	Dry [✓]
6.	Number of samples in shipping container: 1 SAMPLES			
7.	Number of containers per sample: (2 EACH) (Or see CoC _____)			
8.	Paperwork agrees with samples?	Yes [✓]	No [ ]	
9.	Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [✓]			
10.	Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]			
11.	Describe any anomalies: THE AIRBILL WONT MATCH WITH THE CHAIN OF CUSTODY.			
13.	Was P.M. notified of any anomalies? Yes [✓] No [ ] Date 6-20-01 2:pm			
14.	Received by E Reguro Date: 6-20-01 Time: 10:Am			

Customer Sample No.	cpm	mr/hr	Customer Sample No.	Cpm	mr/hr

Ion Chamber Ser. No. _____ Calibration date _____

Survey Meter Ser No. _____ Calibration date _____